Combined Sewer Overflow Operational Plan

Annual Update

Gary Sanitary District

Consent Decree NO. 2:16CV512-PPS

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Section 1 – Introduction

1.1 Introduction

The Gary Sanitary District (GSD) has prepared and is submitting this Combined Sewer Overflow Operational Plan (CSOOP) Annual Update to the United States Environmental Protection Agency (USEPA) and the Indiana Department of Environmental Management (IDEM) in accordance with the provisions contained in Section VIII, Paragraph 15 of the Consent Decree No. 2:16CV512-PPS and Section III of Attachment I of the 2017 NPDES Permit No. IN 0022977.

Part a. of Paragraph 15 of the Consent Decree states the following: "No later than 60 Days after the Effective Date, Defendants shall submit to Plaintiffs for review and approval a revised version of the CSOOP that was initially approved by IDEM in 1994. The revised CSOOP shall comply with Section III of Attachment A to the 2012 NPDES Permit and shall include the items identified in Appendix 1 to this Decree that are organized under the following chapters: (1) Document History and Summary of Changes, Revisions and/or Modifications; (2) System Inventory; (3) Administrative Structure; (4) Operation and Maintenance; (5) CSO Operational Control Strategy; and (6) Schedule of Future Activities."

Part b. of Paragraph 15 of the Consent Decree states the following: "By January 31 of each year following the year of submission of the revised CSOOP pursuant to Paragraph 15.a of this Decree, Defendants shall submit to Plaintiffs for Plaintiffs' approval any updates, modifications, and/or revisions of the CSOOP…"

On November 28, 2013 GSD completed a draft version of the CSOOP. IDEM reviewed and commented on the draft 2013 version. GSD incorporated responses to IDEM comments and submitted the revised CSOOP in accordance with the Consent Decree on 5/18/2018 (60 days after the effective date of the Consent Decree). USEPA submitted comments to GSD on the CSOOP submittal on 7/26/2018 to which GSD responded on 8/23/2018. Subsequently, USEPA provided follow up questions on 11/19/2018. This CSOOP Annual Update incorporates responses to these comments and follow up questions. **Appendix 9** presents the response to the comments received in 2018, and **Appendix 10** presents the comments themselves.

1.2 Historical Activities

GSD maintains an up-to-date CSOOP. **Table 1-1** summarizes the submittals made by GSD to comply with various Federal and State of Indiana Combined Sewer System Controls and requirements:

Table 1-1. Historical Activities Time Line

Activity	Date
Submitted original Combined Sewer Overflow Operational Plan to IDEM	August 1992
Received IDEMs approval of the CSOOP	April 1994
Submitted a revision to the CSOOP to IDEM	June 1998
Received IDEMs approval of the revised CSOOP	August 1998
Submitted a revision to the CSOOP to IDEM	November 2013
Submitted Revised Version of the CSOOP to IDEM and USEPA in accordance with the 3/19/2018 Consent Decree	May 18, 2018
Submitted Annual Update of the CSOOP to IDEM and USEPA in accordance with the 3/19/2018 Consent Decree	January 31, 2019

1.3 Scope

The intent of the CSOOP is to provide GSD with mechanisms and specific procedures to ensure that the nine-minimum technology-based controls for combined sewer overflows (CSOs) are followed and activities are properly documented. The nine minimum controls include:

- Proper operation and regular maintenance
- Maximum use of the collection system for storage
- Review and modifications of pretreatment programs
- Maximization of flow to the POTW for treatment
- Prohibition of CSO discharges during dry weather;
- Control of solid and floatable materials in CSO discharges
- Pollution prevention programs
- Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
- Monitoring to effectively characterize CSO impacts, and the efficacy of CSO controls

1.4 Operational Plan

This CSOOP is divided into the following sections:

- Section 1 Introduction
- Section 2 System Inventory
- Section 3 Administrative Aspects
- Section 4 Maintenance
- Section 5 Control Strategy
- Section 6 Schedule of Future Activities

Figures, Tables, and Appendices are provided for supplemental information.

1.5 Combined Sewer System

Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time, combined sewer systems transport all collected wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally at strategic locations (CSOs) and discharge excess wastewater directly into receiving waters.

1.6 Problems Associated with Combined Sewer Systems

The discharge at these CSOs contains storm water, untreated human, commercial, and/or industrial waste; potentially toxic materials; and debris.

1.7 Combined Sewer Controls

Technologies exist to control pollution from CSOs and storm water runoff. These technologies can be grouped into the following three main categories:

1. SOURCE CONTROLS: Source controls include those measures for reducing pollution from CSOs and storm water that involve actions within the upstream urban drainage basin before the urban water reaches the sewer system, affecting the volume and quality of the polluted discharge.
2. COLLECTION SYSTEM CONTROLS: Collection system controls are intended to ensure that the combined sewer system operates as efficiently as possible and that maximum advantage is taken of opportunities to reduce CSOs.
3. TREATMENT CONTROLS: Treatment controls are technologies that remove pollutants from combined sewer overflows.

Table 1-2 summarizes how the nine-minimum technology-based controls and three main pollution control categories interrelate.

Table 1-2. Nine Minimum Controls

Nine Minimum Technology-Based Controls	Pollution Control Categories		
	Source Control	Collection System Control	Treatment Control
Proper operation and maintenance of collection system		X	
Maximum use of collection system for storage	X	X	
Review and modification of pretreatment programs		X	
Maximization of flow to POTW for treatment		X	X

Nine Minimum Technology-Based Controls	Pollution Control Categories		
	Source Control	Collection System Control	Treatment Control
Prohibition of CSO discharges during dry weather		X	X
Control of solid and floatable materials in CSO		X	X
Pollution prevention programs	X		
Public notification to ensure that public receives adequate notification of CSO occurrences and CSO impacts	X		
Monitoring to effectively characterize CSO impacts, and efficacy of CSO controls		X	X

Section 2 – System Inventory

2.1 Service Area

The City of Gary, Indiana is located in northeast Lake County, Indiana, and is generally bounded on the north by Lake Michigan, on the west by Cline Avenue, on the south by 53rd Avenue and on the east by Lake-Porter County Line Road. **Figure 2-1** shows the general boundaries of the geographical service area. GSD's collection system collects flows from the City of Gary, as well as the City of Hobart, Indiana, the City of Lake Station, Indiana, and the Merrillville Conservancy District in Indiana.

2.1.1 Population Served by the WWTP

In 2018, GSD serviced a total population of 151,618 people with 60,425 total households. This population consists of 76,424 people from the City of Gary with 31,205 households, 34,994 people from the Town of Merrillville with 13,513 households, 28,248 people from the City of Hobart with 11,512 households, and 11,952 people from the City of Lake Station with 4,195 households.

2.1.2 Service Connections

As stated above GSD provides service to 151,618 residents. GSD also services 1,775 commercial properties as of 2018, and 27 Industrial Users.

2.1.3 Industrial Users

GSD provides service to a total of 27 Industrial Users, of which 13 are Significant Industrial Users, and none are Categorical Industrial Users. **Table 2-1** presents a list of the industrial users. **Figure 2-3** shows the locations of the SIUs in proximity to GSD's permitted CSO outfalls.

Table 2-1. List of Industrial Users

IU Number	Name of Industry	Address of Industry	Contact Information	Classification of Industry
1	*Beaver Oil Company*	1040 Michigan St. Gary, IN 46402	(219) 881-9234	Significant Industrial User
2	*Buffington Harbor Casino Resort*	1 Buffington Harbor Dr. Gary, IN 46406	(219) 977-7777	
3	*Chase Street Partners*	700 Chase St. Gary, IN 46404	(312) 933-3298	
4	*Chicago Steel*	700 Chase St. #1 Gary, IN 46404	(219) 949-1111	Significant Industrial User
5	*Elgin, Joliet & Eastern Railroad*	1 North Buchanan St. Gary, IN 464602	(708) 332-3087	
6	*Loves Travel Center*	3150 Grant Street Gary, IN 46408	(219) 981-4640	Significant Industrial User

IU Number	Name of Industry	Address of Industry	Contact Information	Classification of Industry
7	*Gary Chicago Airport*	6001 Airport Road Gary, IN 46406	(219) 949-9722	
8	*Gary Public Transportation Corporation*	2101 W. 35th Avenue Gary, IN 46408	(219) 884-6100	
9	*Gary Sanitary Landfill*	839 Broadway Gary, IN 46402	(219) 949-9722	Significant Industrial User
10	*Welsh*	201 Mississippi Street Gary, IN 46406	(219) 883-4129	
11	*Golars*	4500 Broadway Gary, IN 46408	(317) 500-0000	
12	*Golars*	2301 E. 15th Avenue Gary, IN 46408	(317) 500-0000	
13	*Indiana-American Water Company*	650 Madison Street Gary, IN 46402	(800) 492-8373	Significant Industrial User
14	*Indiana Industrial Investments*	76 North Bridge Street Gary, IN 46406	(219) 881-2765	
15	*Lake Shore Trucking*	2250 E. 15th Avenue Gary, IN 46402	(219) 882-0105	Significant Industrial User
16	*Methodist Hospital - Northlake*	600 Grant Street Gary, IN 46402	(219) 886-4000	Significant Industrial User
17	*Monosol*	1701 County Line Road Portage, IN 46368	(219) 762-3165	Significant Industrial User
18	*NIPSCO Construction*	2800 E. 15th Avenue Gary, IN 46402	(574) 876-6040	
19	*NIPSCO Meter Repair Shop*	3511 E. 15th Avenue Gary, IN 46402	(219) 292-1626	
20	*NIPSCO Operations*	1460 E. 15th Avenue Gary, IN 46402	(219) 246-8713	
21	*NIPSCO Transportation*	2800 E. 15th Avenue Gary, IN 46402	(219) 238-3284	
22	*Petro #369*	3001 Grant Street Gary, IN 46408	(440) 808-7368	Significant Industrial User
23	*Schneider National Trucking*	7101 W. 17th Avenue Gary, IN 46406	(219)9 44-0096	Significant Industrial User
24	*Stericycle*	1310 Michigan Street Gary, IN 46402	(219) 886-3628	Significant Industrial User

IU Number	Name of Industry	Address of Industry	Contact Information	Classification of Industry
25	*Travel Centers of America*	2510 Burr Street Gary, IN 46406	(219) 845-3721	Significant Industrial User
26	*Tri-State Coach Lines*	2101 W. 37th Avenue Gary, IN 46408	(219) 884-0054	
27	*USS Corporation*	1 North Broadway Gary, IN 46402	(219) 888-3369	Significant Industrial User

2.1.4 Satellite Communities

GSD has agreements to provide wastewater treatment to three satellite communities. These communities are the City of Hobart, the City of Lake Station, and the Merrillville Conservancy District. These agreements can be found in **Appendix 2**. The sewers in these communities are separate sanitary. As per these agreements, GSD has agreed to treat a flow of 4.18 MGD from Hobart, 2.0 MGD from Lake Station, and 8.4 MGD from the Merrillville Conservancy District.

The connections of these satellite communities to the GSD system is shown in **Figure 2-1**.

2.2 Sewer System (Combined, Sanitary, and Storm)

The existing sewer system is currently composed of approximately 399 miles of sewers (not including satellite community sewer systems). The system's interceptor sewers (36 inches in diameter or larger) comprise approximately 52 miles. The area consists of four distinct basins within GSD's system (within the City of Gary Limits). These four basins are the Miller/Aetna Area, the South Area, the Central Area, and the West Area. Each area exhibits the same soils type, primarily sand. **Figure 2-2** presents the locations of the collection system components.

2.2.1 Age, Length, Materials, Sizes, and Depths of Sewers

The oldest sewers in the City of Gary are over 100 years old. The average age of the sewers in Gary is approximately 84 years old. Sewers in Gary are made of vitrified clay, concrete, reinforced concrete, brick, and PVC. Sewers in Gary are between 6 and 20 feet deep, with an average depth of approximately 9 feet. **Table 2-2** shows the various pipe sizes and corresponding length in Gary.

Table 2-2. Pipes Sizes and Lengths

Sewer Size	Length of Sewer in Feet
8-inch	177,695
10-inch	160,153
12-inch	810,959
15-inch	246,726
18-inch	127,453
20-inch	15,547

Sewer Size	Length of Sewer in Feet
21-inch	40,052
24-inch	91,534
27-inch	10,328
30-inch	61,171
33-inch	3,694
36-inch	57,139
42-inch	44,339
48-inch	49,161
54-inch	39,692
60-inch	31,126
66-inch	17,643
72-inch	39,351
78-inch	6,065
84-inch	22,501
90-inch	1,342
96-inch	5,970
108-inch	5,563
5'x9' Box Sewer	2,844
86-inch x 106-inch Box Sewer	3,165
4'x5' Box Sewer	14,802
4-inch Force Main	3,730
6-inch Force Main	5,622
8-inch Force Main	2,755
10-inch Force Main	1,159
12-inch Force Main	7,025
30-inch Force Main	4,075
42-inch Force Main	6,077

2.2.2 Physical Condition of the Pipes

GSD's sewer system is approximately 100 years old, with several sewers reaching their useful life. Many of the pipes have cracks, large amounts of infiltration and inflow, and roots. Because of the age of the pipes, cave-ins occur, and repairs are made every year

2.2.3 Collection System and Service Area – Problem Areas

With such an aging infrastructure, GSD has several problem areas throughout its collection system. A sewer cleaning and televising project was completed between 2003 and 2007, which provided a comprehensive look at the larger pipes within GSD's collection system. All pipes greater than 18-inches in diameter were cleaned and

televised during this project (approximately 520,000 linear feet). The videos were reviewed to perform a condition assessment on the pipes, assigning each segment a code based on severity of deterioration. That assessment resulted in the determination that 9% of the larger diameter pipes that were televised have already failed or are projected to fail within the next five to ten years, at the time of the study. GSD has already corrected the most severely deteriorated pipes, approximately 25% of those identified, and continues to make progress on rehabilitation.

Furthermore, GSD completed sewer asset management program in 2019, which includes an evaluation of GSD's current inspection equipment, working with vendors for possible purchase of new equipment, development of a data gathering strategy, development of in-field data collection applications, and an evaluation of facilitating information exchange with other existing software in GSD's system.

2.2.4 Sewer Collection System Maps

Figure 2-2 shows the location of the permitted CSO outfalls, CSO regulators, pump stations, interceptors, and locations where the satellite Communities join GSD's collection system.

2.2.5 Lift Stations (Combined, Sanitary, Storm)

There are 27 lift stations owned and operated by GSD. All pump stations discharge to a force main which then eventually discharges to a gravity main. **Table 2-3** provides a list of existing pump stations, locations, capacity, and to which trunk sewer the pump station ultimately discharges. Standard Operating Procedures (SOPs) for the pump stations are presented in **Appendix 5-1**.

Table 2-3. Lift Stations

#	Station Name	Address	Latitude	Longitude	Number of Pumps and Size	Pump Type	Firm Capacity (GPM)	Total Capacity (GPM)
Combined								
1	27th & Chase (New)	2719 Chase Street	41.5689	87.3748	4 Pumps @ 15,000 GPM	VFD	45,000	60,000
2	35th & Washington	3521 Washington Street	41.5543	87.3373	n/a (converted to gravity)			
3	54th & Tyler (New)	1010 W. 54th Avenue	41.5208	87.3484	3 Pumps @ 800 GPM	Constant Speed	1,600	2,400
4	54th & Tyler (Old)	1010 W. 54th Avenue	41.5208	87.3484	2 Pumps @ 1,700 GPM	Constant Speed	1,700	3,400
5	15th & Clay	4600 E. 15th Place	41.5684	87.2806	4 Pumps @ 6,600 GPM	Constant Speed	19,800	26,400
6	Forrest	8245 Forrest Avenue	41.6144	87.2355	2 Pumps @ 1,500 GPM	Constant Speed	1,500	3,000
7	Sunrise (Spencer Street)	5th Ave and Spencer Street	41.6009	87.2359	3 Pumps @ 282 GPM	Constant Speed	564	846
8	Anderson (Blaine)	333 Blaine Street	41.6072	87.4243	2 Pumps @ 50 GPM	Constant Speed	50	100

#	Station Name	Address	Latitude	Longitude	Number of Pumps and Size	Pump Type	Firm Capacity (GPM)	Total Capacity (GPM)
Sanitary								
9	Hobart Street	460-464 Hobart Street	41.6024	87.4172	2 Pumps @ 100 GPM	Constant Speed	100	200
10	25th & Calhoun	5713 West 25th Avenue	41.5736	87.4058	3 Pumps @ 1,800 GPM	Constant Speed	3,600	5,400
11	25th & Bell	6902 West 25th Avenue	41.5736	87.4216	2 Pumps @ 400 GPM	Constant Speed	400	800
12	27th & Calhoun	2731 Calhoun Street	41.5695	87.4074	3 Pumps @ 800 GPM	Constant Speed	1,600	2,400
13	33rd & Burr	33rd and Burr Street	41.5613	87.4038	2 Pumps @ 500 GPM	Constant Speed	500	1,000
14	Marshalltown	2387 Wisconsin Street	41.576	87.3058	3 Pumps @ 500 GPM	Constant Speed	1,000	1,500
15	Marquette Sanitary	800 Montgomery Street	41.6176	87.2517	1 Pump @ 250 GPM 1 Pump @ 500 GPM 1 Pump @ 750 GPM	Constant Speed	750	1,500
16	Marquette Beach	7190 Oak Avenue	41.6206	87.252	2 Pumps @ 80 GPM	Constant Speed	80	160
17	Lakeshore Drive East	9400 Lakeshore Dr.	41.6227	87.2303	2 Pumps @ 500 GPM	Constant Speed	500	1,000
18	Lakeshore Drive West	8900 Lakeshore Dr.	41.6235	87.224	2 Pumps @ 500 GPM	Constant Speed	500	1,000
19	US20 & Hwy 51	US20 & Route 51	41.5954	87.2402	2 Pumps @ 282 GPM	Constant Speed	282	564
20	Lake Street	860 N. Lake Street	41.618	87.2689	2 Pumps @ 282 GPM	Constant Speed	282	564
21	Airport	6001 Airport Road	41.6116	87.3964	2 Pumps @ 1,800 GPM	Constant Speed	1,800	3,600
Storm								
22	34th & Burr	34th Ave & Burr Street	41.5608	87.4021	4 Pumps @ 14,588 GPM	Constant Speed	43,764	58,352
23	32nd & Grant	32nd Ave & Lincoln Street	41.5601	87.3554	2 Pumps @ 282 GPM	Constant Speed	282	564
24	42nd & Johnson	4229 Johnson Street	41.5417	87.3542	4 Pumps @ 33,000 GPM	Constant Speed	99,000	132,000
25	48th & Carolina	4818 Carolina Street	41.5311	87.3285	n/a (abandoned)			
26	2nd & Tennessee	100 Tennessee Street	41.5744	87.3226	3 Pumps @ 500 GPM	Constant Speed	1,000	1,500
27	Marquette Storm	800 Montgomery Street	41.6176	87.2518	4 Pumps @ 18,000 GPM	Constant Speed	54,000	72,000
28	15th & Fulton	7107 W. 15th Avenue	41.586	87.4044	2 Pump @ 400 GPM	Constant Speed	400	800
29	Connecticut Street	33rd Avenue & Connecticut Street	41.55867	87.3333	3 Pump @ 8,000 GPM	Constant Speed	16,000	24,000

2.2.6 CSO Outfalls

GSD's collection system has twelve NPDES permitted CSO outfalls. The CSOs are designed to provide points of hydraulic relief to the combined sewer system to prevent flooding within the collection system and potential long-term facility damage during major power outages, planned shutdowns, equipment failure, and high flow events due to wet weather. **Table 2-4** provides a list of the CSOs, locations, and configurations, grouped by receiving water body. **Figure 2-3** shows the locations of these outfalls along with proximity to SIUs.

Table 2-4. CSO Outfalls

NPDES Outfall Number	Outfall Location	Weir (ft)				Orifice Size (ft)	River Weir Elevation (ft)	Gate Operation	Note
		Length (ft)	Offset (ft)[1]	Pre-2008 Elevation (ft)	Post-2008 Elevation (ft)				
	West Branch Little Calumet River								
004	15th Avenue and Elkhart Street	6.3	3.05	586.0	No Change	4x4	Flap Gate	No	
005	32nd Avenue and Broadway West	12	2.4	596.4	No Change	None	None	No	
013	25th Avenue and Louisiana Street	16	3.58	590.6	No Change	None	None	No	
015	32nd Broadway and Alley 1 East	15	4.8	596.5	No Change	None	None	No	Concrete weir at 591.5 ft[2]
	East Branch Grand Calumet River								
006	Rhode Island at East Interceptor	9	4.5	580.9	No Change	4x4	588.1	Yes	Concrete river weir at 585.2 ft[2]
007	Alley 9 at East Interceptor	16	3	581.9	No Change	5x3	589.5	Yes	Concrete river weir at 586.7 ft[2]
008	Polk Street at East Interceptor	5	2.2	585.1	No Change	1x1	585.5	Yes	
009	Pierce Street at East Interceptor	4x6 Gates	1.19	580.1	No Change	4x4	585.5	Yes	First weir is 3 flap gates each 4 ft x 6 ft
010	Bridge Street at East Interceptor	15	7.1	584.6	585.71	3x3	None	Yes	Concrete weir at 582.9 ft[2]
011	Chase Street at East Interceptor	13	1.5	578.1	586.1	7x3	586.17	Yes	Concrete river weir at 583.67 ft[2]
012	Colfax Street at West Interceptor	13.6	6.95	583.6	585.35	3x3	583.8	Yes	Concrete weir at 583.08 ft[2] Broken area of river weir low at 582.9 ft[2]

Notes:
(1) Weir offset refers to the local height of the weir relative to the invert of the regulator structure.
(2) Several weir structures include in their weir elevation iron stop logs. For these locations the top elevation of the "concrete weir" on which the stop logs are stacked is provided.
(3) CSO 014 - 25th Avenue and Wisconsin Street - is filled with concrete and not included in the table. It is located upstream of a pump station in Gary's Marshal Town subdivision. During an Army Corp levee project, the levee raised the water level to the point where water was backflowing into CSO 014 and flooding the upstream neighborhood. To prevent that from happening, GSD closed the CSO with concrete. However, GSD does not want to remove the CSO from its NDPES permit because that would require significant cost, effort, and coordination with the Army Corps. Additionally, GSD would like to retain CSO 014 as a permitted CSO outfall in case of emergency.

2.2.7 Rain Gauges

GSD has seven rain gauges throughout its collection system. All seven rain gauges are tipping bucket type and are located near the following pump stations / regulators:

- 27th and Chase Street Pump Station
- 42nd and Johnson Storm Water Pump Station
- 15th and Clay Pump Station
- 2nd and Chase Street Regulator
- 2nd and Colfax Regulator
- Polk Street Regulator
- Rhode Island Regulator

2.3 Wastewater Treatment Plant

2.3.1 Current WWTP Process Flow Diagram

GSD's WWTP consists of the following facilities and infrastructure:

- Headworks (screening, grit removal and pumping)
- Primary Clarifiers
- Secondary Treatment Process
  - Bioreactor Trains
  - Secondary Clarifiers
- Tertiary Filtration
- Disinfection
- Yard Piping and Conduits
- Solids Handling System

Plant influent passes first through the headworks that consists of a single trash rack followed by four (4) mechanical screening and grit removal. From grit removal consisting of two detritus tanks with supporting grit dewatering units, the wastewater is pumped to the primary clarifiers for removal of settable solids and particulate biochemical oxygen demand (BOD). Primary sludge is pumped to a de-gritter then gravity thickened prior to stabilization via anaerobic digestion. Primary effluent is distributed to six bioreactor trains operated in an anaerobic-oxic (A/O) configuration for enhanced biological phosphorus removal and nitrification. Mixed liquor from the aeration tanks is distributed to the secondary clarifiers. Secondary effluent is pumped to deep bed sand filters for tertiary filtration. Once filtered, the effluent is seasonally chlorinated and de-chlorinated with sodium hypochlorite and sodium bisulfite, respectively. Return activated sludge is returned to the head of the aeration tanks. Waste activated sludge (WAS) is thickened via a gravity belt thickener prior to digestion. Thickened WAS and primary solids are mixed prior to digestion. Digested sludge is then dewatered by belt filter press prior to ultimate disposal by landfilling.

A flow schematic showing flow distribution and major unit processes is shown in **Figures 2-4a and 2-4b**.

2.3.2 Detailed Description of Unit Operation, Process and Major Pieces of Equipment Employed at the WWTP

Table 2-5 shows the maximum peak treatable flow for each WWTP unit process. The WWTP staff have shown that they are able to treat flow higher than design firm capacity of particular units without degrading plant effluent quality; however, operating in this mode does have longer term implications, for example, more frequent equipment maintenance requirements. Currently, the tertiary filters are bypassed during flows above 130 MGD (firm capacity of tertiary pumps). The flow bypassed around the tertiary filter is blended with the tertiary effluent and has consistently met permit requirements under recent flow and loading conditions. If higher flows (i.e. above 142 MGD maximum day) are to be treated, the efficacy of continuing to bypass the tertiary process at flows above 130 MGD needs to be examined. Ultimately with more pumping capacity the tertiary filtration system could handle flows up to 160 MGD (firm capacity).

Table 2-5 Maximum Peak Treatable Flows of Each WWTP Unit Process

Unit Process	Current Maximum Peak Treatable Flow	Number of Units	Basis
Trash Rack	142 MGD	1 Duty	WEF MOP 8 recommends velocity of 3 ft/sec at maximum flows, which would rate the screen at a 100 MGD firm capacity; however, based on system performance flows up to 142 MGD are acceptable.
Fine Screens	142 MGD	3 Duty (1 Standby)	Based on a WEF MOP 8 the recommended approach velocity of 3 ft/sec rates the firm capacity at 133 MGD with one unit out of service. The plant has stressed these screens up to 142 MGD without degrading performance.
Grit Tanks	150 MGD	2 Duty	Standard Design for detritus tanks (grit tanks) as detailed in Metcalf and Eddy (1999) is based on grit removal of at least 95% removal of 100 mesh grit. With this design condition the grit tanks are rated for a firm capacity of 104 MGD. At a peak hour flow of 150 MGD, the system is expected to removal 95% of grit greater than 70 mesh, which is acceptable for a maximum day condition. The system has only been stressed up to 142 MGD.
Influent Pumps	150 MGD	5 Duty (2 Standby)	The influent pumps firm capacity of 150 assumes that each wet well has a redundant (standby) pump. Potentially the option to reduce the number of standby pumps could be explored in the future, but due to the current limitations of the secondary treatment process 142 MGD should be considered the maximum day peak treatable flow for the GSD WWTP based on raw influent flow.
Primary Clarifiers	150 MGD	8 Duty Squircle 2 Duty Rectangular	Based on a Ten States Standards peak surface overflow rate (SOR) of 2,000 gpd/sf, achieved at an influent flow of 150 MGD. Although retrofitted (i.e. clarifier baffles) could maintain adequate performance of the clarifiers at higher flows, further discussions regarding surpassing Ten

Unit Process	Current Maximum Peak Treatable Flow	Number of Units	Basis
			States Standards are required.
Bioreactors (Aeration Tanks)	142 MGD	2 Duty – 4 Pass 4 Duty – 3 Pass 20 MG (Total)	Based on the current loading rates and required level of treatment the current volume is adequate when operated at a minimum SRT of 12 days and MLSS of 3,800 mg/L. Capacity of a secondary treatment process is highly dependent on influent conditions, operational flexibility and treatment process configuration. The maximum peak treatable flow is determined by the secondary clarifier capacity.
Secondary Clarifiers	142 MGD	16 Duty Squircle 8 Duty Circular	Based on solids flux using a state point analysis with the current operating conditions (i.e. MLSS concentration of 3,800 mg/L and SVI of 125 mL/g) the current maximum day secondary clarifier capacity is 142 MGD (based on raw influent flow). State point is the recommended method to determine secondary clarifier capacity and well documented in WEF MOP 8. Using this analysis, a maximum peak treatable flow rating is developed for the maximum day condition.
Filter Influent Pumps	130 MGD	4 Duty (1 Standby)	The filter system capacity with 4 duty pumps is 130 MGD for the pumping system. With 9 filters in service the maximum pumping capacity correlates to hydraulic loading rate of 4.7 gpm/sqft.
Effluent Filters	160 MGD	9 Duty (1 Standby)	WEF MOP 8 states that typical sand filtration should have a maximum hydraulic loading rate of 6.0 gpm/sqft, which is achieved at 160 MGD at the GSD WWTP with 9 filters in service. It should be noted that currently the pumping system is unable to deliver 160 MGD to the filters.
Chlorine Contact Tanks	224 MGD	5 Duty	WEF MOP 11 and Ten States Standards require states peak flow chlorine contact basin detention time should be at minimum 15 minutes during peak flows, which is achieved at 224 MGD at the GSD WWTP.

2.3.3 Monitoring Protocol

All permitted CSOs are monitored via telemetry. When there is a CSO event, the time, duration, and volume of sewage that overflowed is recorded and is reported by GSD in its monthly report to IDEM. Actual plant influent flow is calculated with the sum of three magnetic flow meters which each feed a bank of Primary Clarifiers. Two of the mag meters are 48-inches in diameter, while the third is 54-inches in diameter. Sampling requirements and frequency for the treatment plant are found in **Table 2-8**. Table 2-8 also contains NPDES Permit limits for the plant's effluent.

2.3.3.1 Data

Samples for GSD's WWTP outfall are taken on a routine basis. E. Coli and chlorine residual samples are taking from April 1st through October 31st from the plant's effluent. There is a dissolved oxygen meter near the outfall and is used for the operation of the treatment plant. All samples are held and preserved in accordance with 40 CFR Part 136.

2.3.3.2 Observation and Reporting Adverse Effects

All data collected from the treatment plant's outfall are reported to the Indiana Department of Environmental Management on a monthly basis. All data within Table 4 meet acute water quality criteria for protection of Aquatic Life.

2.3.4 Treatment Plant Flows

The wastewater treatment plant flow averages from 2010 to 2019 are in **Table 2-6**. The treatment plant has an average daily design flow of 60 MGD and a peak hourly design flow of 120 MGD. The wastewater treatment plants secondary treatment process was last updated in 2002 with improvements to the Aeration Basins, which converted the treatment plant from a two-stage activated sludge plant to a single-stage activated sludge plant. In 2018 start-up and commissioning of an improved deep bed sand filter was completed for tertiary treatment. The wastewater treatment plant performance continues to meet its NPDES permit on average. The plant facilities were explained in Section 2.3.2.

Table 2-6. Average Daily Flow

Year	Average Annual Daily Flow (MGD)
2010	45.3
2011	49.6
2012	40.3
2013	46.8
2014	52.8
2015	47.0
2016	49.9
2017	48.2
2018	44.9
2019	56.2

In recent years, GSD has made efforts to bring more equipment on-line to treat greater peak wet weather flows at the WWTP. Since 2010 the Peak Flow of the WWTP has increased from 105.6 MGD to 142.3 MGD in 2018 while peak instantaneous flow rates have increased from 126.8 MGD in 2010 to as high as 158.9 MGD in 2016. This is presented in **Table 2-7**.

Table 2-7. Peak Flow Rates

Year	Peak Daily Flow (MGD)	Peak Instantaneous Flow (MGD)
2010	105.6	126.8
2011	108.0	144.0
2012	104.5	140.2
2013	114.1	150.2
2014	125.1	152.1
2015	125.0	149.8
2016	110.6	158.9
2017	121.1	154.0
2018	142.3	152.5
2019	129.1	156.0

2.4 Groundwater Levels

The groundwater table varies from north to south in the collection system. Generally, land north of Ridge Road is sandy with low groundwater tables, while areas south of Ridge Road tend to be more clay with a high groundwater table. However, there are several wetland areas in various locations near the Little Calumet and Grand Calumet areas. These areas also have high groundwater tables.

2.5 Quality of Receiving Waters

Both the Little Calumet River and the Grand Calumet River are listed on the IDEM's 303(d) list as impaired bodies of water. The Little Calumet River has a seven-day, ten-year low flow (Q7,10) of 182 cfs (117.6 MGD), while the Grand Calumet River has a seven-day, ten-year low flow of 352 cfs (227.5 MGD). Both rivers are in the Lake Michigan drainage basin and are therefore subject to the Indiana Water Quality Standards applicable to all water of the State within the Great Lakes System in accordance with 327 IAC 2-1.5.

The wastewater treatment plant outfall to the Grand Calumet River is approximately 5 miles from the Indiana Harbor Ship Canal, which empties into Lake Michigan. The Indiana portion of the open waters of Lake Michigan is designated as outstanding state resource water in accordance with 327 IAC 3-1.5-19(b). Discharge to tributaries of outstanding state resource waters is subject to anti-degradation implementation procedures for outstanding state resource waters.

The Little Calumet River has the following designated uses (327 IAC 2-1.5-5).

- Full-body contact recreation
- Capable of supporting a well-balanced, warm water aquatic community
- Salmonid waters (capable of supporting a salmonid fishery) for Burns Ditch downstream of the confluence with the East Branch of the Little Calumet River

The Grand Calumet River has the following designated uses (327 IAC 2-1.5-5).

- Full-body contact recreation
- Capable of supporting a well-balanced, warm water aquatic community

Under IDEM's 2018 303(d) list the following impairments are listed

- For the portion of the Little Calumet River east of Grant Street in Gary, Indiana:
  - *E. coli* (Category 4A),
  - PCBs (Category 5B), and
  - biological integrity (Categories 4A/4C).
- One CSO discharges to the Little Calumet River west of Grant Street. The following impairments are listed for this river segment:
  - *E. coli* (Category 4A),
  - PCBs (Category 5B),
  - biological integrity (Category 5A),
  - dissolved oxygen (Category 5A),
  - free cyanide (Category 5A),
  - nutrients (Category 5A), and
  - chloride (Category 5A).
- The following impairments are listed for the Grand Calumet River for segments between GSD's CSOs and the Indiana Harbor Ship Canal:
  - PCBs (Category 5B),
  - ammonia (Category 5A),
  - biological integrity (Category 5A), and
  - oil and grease (Category 5A).

IDEM submitted the 2018 Integrated Report to USEPA on August 17, 2018. The 2018 Consolidated List (Categories 1-5) was partially approved by USEPA on May 9, 2019.

2.6 Effluent Standards

The current NPDES permit (**Appendix 1**) contains effluent limitations and monitoring requirements for the wastewater treatment plant, Outfall 001A and 001B, in Part 1, A. **Table 2-8** lists the parameters and effluent limitations as specified in the NDPES permit.

Table 2-8. NPDES Permitted Effluent Limits (Effective July 1, 2017)

	Quantity or Loading				Quality or Concentration					Monitoring Requirements	
Parameter	Monthly Average	Weekly Average	Daily Maximum	Units	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	---	---	MGD	---	---	---	---	---	Daily	24-hour Total
CBOD											
Summer	5,007	7,511	---	lbs/day	5.0	7.5	---	---	mg/l	Daily	24-hour Composite
Winter	8,812	13,218	---	lbs/day	8.8	13.2	---	---	mg/l	Daily	24-hour Composite
TSS											
Summer	6,008	9,013	---	lbs/day	6.0	9.0	---	---	mg/l	Daily	24-hour Composite
Winter	9,613	14,420	---	lbs/day	9.6	14.4	---	---	mg/l	Daily	24-hour Composite

Parameter	Monthly Average	Weekly Average	Daily Maximum	Units	Monthly Average	Weekly Average	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
Phosphorus	---	---	---	---	1.0	---	---	---	mg/l	Daily	24-hour Composite
pH	---	---	---	---	---	---	6.0	9.0	s.u.	Daily	Grab
Dissolved Oxygen											
Summer	---	---	---	---	---	---	6.0	---	mg/l	Daily	12 Grabs / 24 hours
Winter	---	---	---	---	---	---	5.0	---	mg/l	Daily	12 Grabs / 24 hours
Oil & Grease	---	---	---	---	---	---	---	10	mg/l	5X Weekly	Grab
E. Coli	---	---	---	---	125	---	---	235	cfu/100 ml	Daily	Grab
Ammonia-Nitrogen											
Summer	1,001	---	2,333	lbs/day	1.00	---	---	2.33	mg/l	Daily	24-hour Composite
Winter	1,132	---	2,634	lbs/day	1.13	---	---	2.63	mg/l	Daily	24-hour Composite
Total Residual Chlorine											
Final	8	18	18	lbs/day	0.008	18	18	0.018	mg/l	Daily	Grab
Whole Effluent Toxicity											
Acute	---	---	---	---	---	---	---	1.0	TUa	2 X Annually	24-hour Composite
Chronic	---	---	---	---	2.0	---	---	---	TUc	2 X Annually	24-hour Composite
Arsenic	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Cadmium	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Chromium	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Copper	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Cyanide	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Lead	---	---	Report	lbs/day	---	---	---	Report	mg/l	Quarterly	24-hour Composite
Mercury											
WQBELs	0.00065	---	0.0016	lbs/day	1.3	---	---	3.16	ng/l	6 X Annually	Grab
SMV Interim Discharge Limit	---	---	---	---	1.8	---	---	Report	ng/l	6 X Annually	Grab
Nickel	---		Report	lbs/day	---			Report	mg/l	Quarterly	24-hour Composite
Zinc			Report	lbs/day	-			Report	mg/l	Quarterly	24-hour Composite
Phenols	---		Report	lbs/day	---			Report	mg/l	Quarterly	24-hour Composite
Chloride	---		Report	lbs/day	---			Report	mg/l	Quarterly	24-hour Composite
Sulfate	---		Report	lbs/day	---			Report	mg/l	Quarterly	24-hour Composite
Fluoride	---		Report	lbs/day	---			Report	mg/l	Quarterly	24-hour Composite

Section 3 – Administrative Aspects

3.1 Structure and Responsibilities

GSD has a Board of Commissioners consisting of five members, appointed by the Mayor of the City of Gary, Indiana.

The senior management team consists of an Executive Director, with a Plant Superintendent.

3.1.1 Organizational Structure

GSD's organizational structure is presented in **Figure 3-1**.

3.1.2 Management / Lines of Authority / Respective Responsibilities

The hierarchy of management and operations in the Operations and Maintenance of the WWTP is listed below including responsibilities.

- Plant Superintendent – Oversee Operations, Maintenance, Safety, and Security
- Operations Manager – Oversee Shift Supervisors, Assistance Supervisors, and Operators
- Shift Supervisor – Oversee operations on their shift
- Assistant Shift Supervisor – Cover Shift Supervisors
- Operators – Handles day to day operations of the WWTP

As of 2019, GSD has 25 employees for the collection system, 24 in operations, 17 in Maintenance, and 5 in Lift Stations.

3.2 Position and Duties of GSD Staff that are Responsible for Monitoring and Controlling CSOs

During an event where potential for an overflow event exists, it is the operator assigned to the Headworks and the Primary Treatment Area that is responsible for monitoring and controlling the CSOs via the procedure explained in the SOP Combined Sewer Overflow Minimization and Wet Weather Guidelines (**Appendix 5-2**). When a CSO event is observed via the telemetry system, the Operations Crew at the WWTP will dispatch personnel from the Lift Station Crew to visually confirm that a CSO event is happening.

3.3 NPDES Permit

GSD's current NPDES Permit (IN0022977) was provided by IDEM on June 23, 2017, and became effective on July 1, 2017. This permit was processed in accordance with Section 402 and 405 of the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251, et seq.), and IDEM's permitting authority under IC 13-15.

3.4 City Ordinances

GSD updated its Sewer Use Ordinance (**Appendix 4**), which became effective on September 18, 2014. This ordinance sets uniform requirements for discharges into, the construction of, and additions to, GSD's wastewater collection and treatment system, which requirements enable GSD to protect public health, ensure a sound sewer infrastructure system, and comply with all applicable local, state and federal laws

This sewer use ordinance objectives are:

- To prevent the introduction of pollutants into GSD's wastewater treatment system that will interfere with normal operation of the wastewater treatment plant or contaminate the resulting municipal sludge, or result in GSD's violation of their ordinance, permits, orders, laws, or rules, and regulations, etc.
- To prevent the introduction of pollutants into GSD's wastewater treatment system which do not receive adequate treatment in the wastewater treatment plant, and which will pass through the plant into receiving waters or the atmosphere.
- To improve the opportunity to recycle and reclaim wastewater and sludge from the system.
- To minimize the introduction of infiltration and inflow into the wastewater collection system that will occupy capacity reserved for community growth.

Furthermore, the Gary Stormwater Management District has adopted a Storm Water Ordinance on July 3, 2006, that regulates the following:

- Discharges of prohibited non-storm water flow into the stormwater discharge system
- Stormwater drainage improvements related to the development of lands located within the City of Gary, Indiana
- Drainage control systems installed during new construction and grading of lots and other parcels of land
- Erosion and sediment control systems installed during new construction and grading of lots and other parcels of land
- The design, construction, and maintenance of stormwater drainage facilities and systems
- The design, construction, and maintenance of stormwater quality facilities and systems

3.5 Sewer Use Agreement

GSD has sewer use agreements with three separate entities. These entities are the City of Hobart, Indiana, the City of Lake Station, Indiana, and the Merrillville Conservancy District in Indiana. These agreements are on file at GSD's Administrative Offices and are attached in **Appendix 2**.

Each agreement makes clear that GSD is not responsible for the collection system and all appurtenances, including lift stations, within the satellite communities themselves.

The City of Hobart's agreement became effective on July 10, 1984; City of Lake Station's agreement became effective on September 6, 1984; and Merrillville Conservancy District's

agreement became effective on October 15, 1985. All three agreements are continuous running agreements unless otherwise agreed upon to dissolve the agreement.

3.6 Industrial Wastewater Permits

Table 2-1 lists permitted Industrial Users.

3.7 Information Services

3.7.1 Record Keeping

Record keeping consists of original blueprints, drawings, and mylar records; most drawings have been converted into electronic copies; videotapes and electronic copies; and field paper records and electronic copies of reports. All blueprints, drawings and mylar records are kept in storage drawers in GSD's Technical Services Department.

GSD reports CSOs events to IDEM on a monthly basis via Monthly CSO Reports. Reports are generated based on data from GSD's telemetry system. GSD utilizes iFIX which is an HMI software to visually display CSO data. CSO flows are calculated by the PLCs in the field and recorded on the Profecy Historian software which is a module to iFIX. PLC records data every thirty seconds and is saved in the Profecy Historian software.

Data acquisition for GIS mapping is recorded on field data sheets and transferred directly to a database periodically.

Requests for services, complaints and problem notifications are recorded on a Work Order and are entered into the proper database by GSD's Administrative Staff. After a problem has been investigated and resolved, the database record is updated by the same staff. This system permits the tracking of Work Orders that are still unresolved.

Manhole inspections are recorded in the field and later entered directly into the GIS database.

Electronic video records are saved on GSD's internal network.

Lift station corrective and preventive maintenance activities are recorded by maintenance crew on the proper form and later entered into a lift station database by GSD's Administrative Staff.

3.7.2 Availability

Ultimately, all collection system data, including CSO data, will be stored electronically and available to all collection system personnel and other GSD personnel. Currently, while there is no restriction on access to blueprints and drawings, administrative, superintendent, and supervisor level personnel generally utilize these resources. Mylar drawings are not distributed for protection of this resource.

Electronic versions of the 14 section maps are available to all personnel through the Collection or Technical Services Departments and are located in an unrestricted shared directory on the internal network.

In addition, electronic versions of video records from sewer televising are available to all Collection Department personnel through three external hard drives in the Technical Services Department.

The manhole inspection database and the pump station database are also accessible by all Collection Department Personnel through the internal network.

3.7.3 Analysis of Data

In general, data is collected, compiled, and evaluated by the appropriate personnel for daily work assignments, identification of developing or actual problems, troubleshooting and planning.

When problems arise that require cooperation between area supervisors, the issue is discussed openly and cooperatively. Weekly supervisor meetings are used to identify problems with pump start frequency and run time duration; potential I/I problems; and reserve capacity at lift stations. Often the analysis results in a cooperative, corrective effort between areas of responsibility.

Section 4 – Maintenance

4.1 O&M of Collection System

The operation and maintenance of the collection system falls under GSD's Technical Services Department. The Technical Services Department is divided into three separate divisions: Collections, Storm Water/MS4, and Lift Stations.

The Collections Department is responsible for the cleaning and maintenance of GSD's combined and sanitary sewer system. The Collections Department is also responsible for the repairs of any damaged storm sewer or catch basins.

However, the Storm Water/MS4 Department is responsible for the cleaning of storm sewer catch basins. The Storm Water/MS4 Department is also responsible for the maintenance of ditches and street sweeping.

The Lift Stations Department is responsible for the operations and maintenance of all GSD Lift Stations including sanitary, combined and storm water. The Lift Stations Department is also responsible for the maintenance of all CSO regulators.

Prior to an expected wet weather event, the Lift Station Crews will ensure all the lift stations pumps are available and ready when needed. During a wet weather event, the Lift Station Crew will verify that in fact, a CSO event is occurring by visually confirming the event.

4.2 O&M of WWTP During Wet Weather

GSD has prepared a Combined Sewer Overflow Minimization and Wet Weather Guidelines for the Operators of the WWTP (**Appendix 5-2**). This guideline provides the strategy necessary to process all wet weather flows received up to the capacity limits of each unit process. During a wet weather event the Operators of the WWTP should place all screening equipment in manual in the event of a rapid flow increase, increase frequency of operator rounds to check for obstructions and proper function of all process equipment, placing enough raw sewage pumps online to reduce the wet well levels which will allow additional storage in the collection system, etc. If the wet well levels cannot be maintained with all available raw sewage pumps online and the treatment plant has exceeded 120 MGD, reducing flow to the treatment plant must take place by partially closing the NPDES permitted Combined Sewer Regulators gate(s) at one of the seven (7) specified CSO regulators within the collection system from nearest to the treatment plant to the farthest. Once the interceptor level stabilizes, and flow through the treatment plant has been maximized, initiate the opening of the regulator's gates in 5% - 10% increments in reverse order until all regulators gates are 100% open. If there is a power failure or equipment malfunction, the main influent gate can be closed in order to prevent flooding of the Treatment Plant Headworks.

4.3 Systems and methods used to Monitor CSOs

GSD utilizes a telemetry system to monitor combined sewer overflow events at the overflow points along the Little Calumet River and the Grand Calumet River. The telemetry system tracking the regulators located along the Grand Calumet River, that can be remotely operated, have the ability to show the flow of the CSO event at each site including the weir level. However, the telemetry system tracking the regulators along the Little Calumet River only measures the level of the weirs and indicates when a CSO event is occurring. Flows of a CSO event along the Little Calumet River can be estimated using an equation based upon the weir level. Data that is collected are entered into a monthly CSO Report and submitted to IDEM.

4.4 O&M Records Procedures

GSD uses standards inspection forms when investigating the conditions of manholes, catch basins, sewers and lift stations. These standard forms can be found in **Appendix 3**.

Service request from customers generally is received over the phone to the Technical Services Department. Once a request for service has been made, a crew is dispatched to investigate the request. Based upon the findings of the investigation, a Work Order is developed and recorded in GSD's MainSaver Computer Program. The work crew prepares a paper Work Order explaining the work they did each day and is turned in at the end of the day to the District Foreman who examines the work order for completeness and notes additional work which may be required. If additional work is required, the Work Order is not turned in as completed. The District Foreman turns in the paper Work Order to the Technical Services Department who then enters the completed Work Order into the MainSaver Program. The computer database is archived for reference use and is backed up by the IT Department on a regular basis.

Most manhole and catch basin repairs are completed by GSD employees, while most sewer cave-in repairs are contracted out to contractors.

4.5 Examples of current Maintenance Checklist/Inspection Sheets

GSD utilizes checklist for the inspections of lift stations, regulators, catch basins, manholes, and sewers. These checklists can be found in **Appendix 3**.

The vital equipment at the treatment plant is inspected on a regular basis by the Operations Department. If the operators observe the equipment is not operating as designed, the Operations Department creates a Work Order, and the Maintenance Department is then notified repairs are needed through this work order.

4.6 Inventory of Equipment and Parts to Control CSOs

GSD utilize various types of equipment to maintain maximum capacity and flow in the collection system and WWTP. Examples of these pieces of equipment are listed below.

Collection System

- Two Televising Trucks
- Boom Truck
- Four Vactor/Jet Trucks
- Two Backhoes
- Front End Loader
- Excavator
- Tiger Mower
- Five Dump Trucks
- One Roll Off Truck
- Four Hydraulic Boom Sweepers
- Bypass pumps for Collections
    - One – 6 inch Surface pump
    - One – 4 inch Hydraulic pump
    - One – 3 inch Wacker pump
- Two Backup Generator for Lift Stations:
    - One – 100 kV
    - One – 50 kV
- Four Bypass Pumps for Lift Stations:
    - Two – 6-inch pump
    - One – 4-inch pump
    - One – 3-inch pump
- Misc. Maintenance

WWTP

- Backup Generator to close the Main Influent Gate of the WWTP
- Switch Gear for second electrical feed during power outage
- T-Rex Crane
- Portable Trash Pumps and Sump Pumps
- Telehandler

Maintenance Equipment

- Vactors/Jet Trucks

Street Sweepers

- Three Hydraulic Boom Sweepers 4?

Critical Spare Parts

- **Appendix 6** contains the list of Critical Spare Parts.

4.7 Maintenance Schedule

4.7.1 Catch Basins

GSD's system has approximately 6,005 catch basins. Catch basins in combined sewer areas are inspected and cleaned as necessary under the same inspection program as cited in Section 4.1. Each year, GSD's Collection Department assigns a map section to a specific crew to inspect catch basins. There are a total of 14 map sections, with all sections being inspected on a three year cycle. Certain special catch basins are cleaned and inspected annually as they are prone to flooding more so than others due to their location of capturing more volume of runoff during a storm event.

Problem catch basins are identified by supervisory review of the databases and are cleaned more frequently. In addition, catch basin cleaning occurs as preventive maintenance before anticipated precipitation events and when street flooding is reported by citizens or other City Departments. Also, GSD has developed a list of catch basins and areas that have been historically identified as trouble areas for standing water, in the event that these catch basins were plugged with debris or blocked via ice dam buildup. **Table 4-1** presents the past recent years of catch basin cleaning.

Table 4-1. Catch Basin Cleaning

Year	Catch Basins Cleaned (#)
2015	990
2016	1,391
2017	1,275
2018	985
2019	2035

4.7.2 Manholes

GSD's system has approximately 11,434 manholes. All manholes are inspected on a ten year cycle. Manholes are cleaned as necessary under the inspection program or as required while resolving a problem under a Work Order. Problem manholes are identified by supervisory review of the databases and are cleaned more frequently. Also, visual "flow checks" are intended to be completed on all manholes within a three year cycle to check for and guard against the potential for debris buildup in the collection systems. Similar to catch basins, each year, GSD's Collection Department assigns a map section to a specific crew to inspect manholes. There are a total of 14 map sections, with all the sections being inspected on a 3 year cycle. **Table 4-2** presents the past recent years of manhole inspections.

Table 4-2. Manhole Inspection

Year	Manholes Inspected
	(#)
2015	1,733
2016	861
2017	1,070
2018	2,051
2019	2,104

4.7.3 Sewers

Current practice is to clean and/or inspect, for preventive maintenance, all sewers every twenty years. **Table 4-3** presents the past recent years of sewer cleaning and televising.

Table 4-3. Sewer Cleaning and Televising

Year	Sewer Cleaning	Sewer Televising
	(feet)	(feet)
2015	125,065	40,087
2016	69,283	15,612
2017	80,850	13,857
2018	89,847	25,160
2019	143,341	13,753

4.7.4 Lift Station

Preventive and scheduled maintenance for lift stations is described in Section 4.1. Preventive Maintenance is scheduled through the MainSaver Computer System. Lift Station Equipment is reviewed on a monthly basis. Regulators and Outfalls are inspected on a daily basis

4.7.5 Maintenance Practices

GSD has a manhole and catch basin inspection standard operating procedure to ensure that each manhole and catch basin is inspected and cleaned as required. Current manhole and catch basin inspection planning efforts anticipate inspecting the manholes associated with 40 miles of sewer per year and completing all manhole and catch basin inspections over a 10-year period.

GSD also has a street cleaning program that helps to keep sediment and debris from entering catch basins, make cleaning them less frequent. GSD street cleaning program goal is to clean over 160 miles of streets each year.

GSD maintenance crew performs lift station maintenance and repair, as required. The thirty (30) lift stations are inspected a minimum of once per week, and more frequently for larger more vital lift stations. Each Lift Station has a specific SOP for Preventive Maintenance. The conversion to real-time telemetry has permitted the reduction of physical inspection frequency without compromising the operation and maintenance of the lift stations.

4.8 Identification of Sewer System Problem Areas

Sewer system problems are identified from various sources: telephone requests for service, citizens' complaints by e-mail, meetings, etc.; information transferred from and generated by other Municipal Departments; and District generated work orders resulting from in-house inspection and maintenance programs.

4.8.1 Street Cleaning

Street cleaning, to remove debris, dirt, and dust, is used to reduce the source of storm water-related pollutants. The majority of the street contaminants are soil and asphalt erosion, automobile contaminants, and sand (due to our proximity to Lake Michigan). Street cleaning is accomplished by hydraulic broom sweepers. Hydraulic boom sweeper loosens dirt from the street surface and collects it in a temporary hopper. GSD cleans the city streets weekday from early spring to late fall, when the complications of freezing are not present. GSD has three sweepers in use. The city is broken up into 13 sections. The four sweepers work in the same section and complete all streets in the section before moving on to the next. It takes approximately 8.6 weeks to complete one of the sections of the city.

4.8.2 Catch Basin Cleaning

A catch basin is a chamber well which accepts street surface water and discharges into a sewer. The catch basin has a sediment sump at its base which traps some of the coarse debris and grit from the surface water runoff. This minimizes sewer clogging and reduces the amount of pollutants which may enter and eventually settle out in the sewers. Cleaning of these catch basins prevents accumulation of sediment which can become re-suspended and enter the sewer with the basin overflow.

GSD has mapped the majority of the catch basins and has prepared a layer on its GIS system. Efforts are on-going to map 100% of the catch basins throughout the collection system.

GSD currently uses crews consisting of two or more individuals to inspect, clean and vacuum the catch basin. The crews use combination jet/vacuum trucks to accomplish these tasks. The number of catch basins cleaned each year is documented and tracked using Daily/Weekly Operating Report (DWOR) (**Appendix 7**). Between 2005 and 2017 a total of 17,494 catch basins have been inspected and cleaned.

4.8.3 Sewer Flushing

The dry weather deposition of solids in sewers is a major cause of the "first-flush" phenomenon. The average dry weather flow velocities are inadequate to keep solids suspended, especially where sewer grades are flat. Up to 30% of the total collected solids may be deposited in combined sewers. Periodic sewer flushing can remove and transport the material to the treatment plant before a storm event washes it into a receiving stream via an overflow. Sewer flushing also maximizes the hydraulic capacity of the sewer for wet weather flows.

Between the years of 2003 through 2007, GSD conducted a heavy sewer cleaning project. This project cleaned sewers 20-inches and larger. A total of 27.644 million pounds of debris were removed over this period of time, and over 97.74 miles of sewer was cleaned. Along with the heavy cleaning, a sewer assessment study was conducted jointly. Several locations of sewers were determined to need immediate repairs and were taken care of before an emergency situation arose.

When sewer cleaning is conducted by GSD staff, it consists of flushing unless an excessive amount of debris is noted by the crew. If debris is noted, the line is vacuumed while flushing. All District flushing vehicles are combination jet/vacuum units.

Between the years 2005 through 2017, GSD staff has continued a sewer flushing program. Starting in 2005 GSD has cleaned over 310 miles of sewers. Tracking of sewer cleaning activities is recorded in GSD's DWOR system (**Appendix 7**). From 2018 through 2019 44.16 miles of sewer have been cleaned and 4118 Manholes have been inspected. Records are kept on sewer blockages and residential back – ups and reviewed in accordance with procedure described in section 4.4.

Records are kept on sewer blockages and residential back-ups and reviewed in accordance with procedures described in Section 4.4.

Sewer televising is accomplished on an as-needed basis. GSD is currently developing a sewer system video inspection schedule that will provide for the adequate inspection of the sewer system.

The sewer system is mapped into 13 sections. There are 2 sewer trunk sections mapped by the route to the treatment plant. Section B-5, B-6, C-3, C-4, C-5 and C-6 flow comes from the east, while Section D-2, D-3, D-4, and E-3flow comes from the south. Sections C-2, D-1 and D-2 flow comes from the west.

GSD has mapped the entire sewer system including all manholes and pertinent information (i.e. rim and invert elevations). GSD currently uses crews consisting of two or more individuals to inspect the manholes. The number of manholes inspected each year is documented and tracked using the same DWOR.

GSD currently is enhancing its sewer asset management program, which includes an evaluation of GSD's current inspection equipment, working with vendors for possible purchase of new equipment, continual enhancement of its data gathering strategy, modernizing its in-field data collection applications, and an evaluation of facilitating information exchange with other existing software in GSD's system. That project is underway and is scheduled for completion Spring 2019.

4.8.4 Lift Stations

GSD's Collection Department maintains the lift stations on both an emergency and preventative maintenance basis. Corrective maintenance is performed on an as-needed basis, twenty-four hours a day. The lift stations are inspected on a daily basis, and the response for the corrective maintenance activities is based on either the visual inspection or by the type of alarm the telemetry is indicating at an individual lift station. GSD began a project to install real-time telemetry at major lift stations throughout the collection system. GSD has installed real-time cellular telemetry system on five Lift Stations to date. The lift stations fitted with this technology now have digital signals for each pump that indicate pump run/off, pump normal/fail, wet well normal/low level, wet well normal/high level, power normal/fail, and backup float control on/off. These lift stations also have an analog input for the wet well level.

For preventative maintenance, lift stations Work Orders are generated through the Mainsaver Program. The Lift Station Crew completes the preventative maintenance on a daily basis.

4.9 Repairs

4.9.1 Catch Basins

Catch basins are repaired on an as-needed basis determined by the procedure described in Section 4.1

4.9.2 Manholes

GSD's manholes are generally in good condition. Degraded manholes are prioritized and repaired as needed.

4.9.3 Sewers

Sewers, whether storm, sanitary or combined, are scheduled for repairs on a priority basis, dependent upon the severity of the cave-in and the potential for additional property damage.

4.9.4 Lift Station

The lift stations within the City of Gary are rehabilitated as needed based on daily inspections.

Section 5 – Control Strategy

5.1 Source Controls

Technology-based controls, also known as the nine minimum controls, are designed to minimize the impact of combined sewer overflows on the water quality of the receiving water body by utilizing source control and collection system controls. These include pollution prevention programs, pretreatment programs, and proper operation and maintenance of the collection system to minimize the duration of overflows and maximize flow to the treatment plant.

5.2 Collection System Controls

Through a telemetry and SCADA system, GSD is able to monitor all CSOs along the Little Calumet River and Grand Calumet River, and also have the ability to control the overflow gates of the regulators of the CSO points along the Grand Calumet River. These and other Collection System Controls are described below.

5.2.1 Conventional Combined Sewer System Controls

5.2.1.1 Side-by-Side Weirs

The side-spill weir is constructed parallel to the combined sewer axis to divert flow from the interceptor sewer. Excess flow passes over the side spill weir into the permitted outfall sewer. The weir should be set to hold back peak dry weather flow, as well as to maximize the use of interceptor capacity during wet weather. This regulator may be used for any volume flow. All the regulators along with the Little Calumet River utilize the side-by-side style weir.

Side-by-side weirs are inspected on a weekly basis and the data collected is entered into GSD's maintenance records.

5.2.1.2 Semi-Automatic Regulators

GSD has installed electrically operated gates for regulators along the Grand Calumet River in lieu of cylinder operated gates. Whenever there is an overflow at one of these regulators, the Collection Department conducts a site visit to visually witness the closed gate and the overflow event.

The regulators along the Grand Calumet River are inspected on a weekly basis and the data collected is entered into GSD's maintenance records.

5.3 Treatment Controls

Currently, GSD is able to treat solids and floatables of CSOs. These treatment measures are handled through street sweeping activities and the regular maintenance and cleaning of the

overflow weir structures. These are explained under the Nine Minimum Control measures under Section 5.5.

5.4 Wet Weather SOPs

5.4.1 Precipitation Monitoring

5.4.2 WWTP Weather Station

GSD uses WeatherBug to monitor weather or precipitation. GSD also utilizes rain gauges throughout the collection as described below.

5.4.3 Location of Other Rain Gauges

Rain gauges capable or measuring 0.01 inch of precipitation are located at 3 lift stations and 4 regulators within GSD's service area. These locations are described in section 2.2.7. The 7 locations were chosen to help monitor CSO during wet weather events. Data is stored on the internal network and is accessible to key personnel. Stored data is used for analysis of storms and impacts on the collection system and the treatment plant.

5.5 Implementation of Nine Minimum Controls

As part of the new NPDES Permit issued on July 1, 2017, GSD was required to comply with the nine-minimum technology-based controls in accordance with the federal CSO Control Policy. A procedure manual was developed in 2004 and continues to be updated based upon operational changes.

5.5.1 Proper Operation and Regular Maintenance Programs

As directed by the Indiana Department of Environmental Management (IDEM), GSD began reporting customer complaints of basement backups into private residences as sanitary sewer overflows beginning in August 2009. Wet Weather CSOs are generally on the Little Calumet River, which does not have a SCADA controlled overflow (only weir overflow) and generally occurs during high flow in those areas. During these times of high flows, GSD processes flow exceeding 120 MGD through the treatment facility in accordance with the Wet Weather Plan and without impacting final effluent quality. GSD continues to work on improving the efficiency of the raw sewage pumps in order to maximize the peak flows the facility can handle.

5.5.2 Maximization of Storage in Collection System

Procedures to maximize the use of storage capacity of the combined sewer system has been established and laid out in GSD***'s Combined Sewer Overflow Minimization and Wet Weather Guideline***. This document explains the strategy to be implemented during wet weather conditions to maximize storage in the collection system prior to a CSO event. It further describes

the sequence to be used in closing CSO Regulators within the collection system to provide hydraulic relief of combined sewage to prevent flooding within the collection system.

Currently, there are no permitted overflow points within the treatment plant. To avoid damage to the treatment plant, excess flow beyond the plant design capacity must be overflowed at twelve (12) NPDEDS permitted CSO control regulators located throughout the collection system.

5.5.3 Review and Modification of Pretreatment Requirements

The Industrial Pretreatment Program enforces the City of Gary's Sewer Use Ordinance (SUO) No. 8839. This program has been modified, reviewed by IDEM and USEPA and submitted to Common Council for adoption. Letters have been sent to all permitted industries requesting Best Management Practice for Wet Weather flow reductions. Similar language has been incorporated into the Industrial Inspections forms. During annual inspections, Industrial facilities are inspected for illegal connections of stormwater streams to the sanitary system. In response to GSD's request for minimization of flows during wet weather, the majority of Industrial clients have adopted measures to either alter production or divert flows into holding tanks. During inspections, the importance of discharge minimization and the potential impact of pollutants to the waterways are conveyed to the industrial representative.

5.5.4 Maximization of Flow to the WWTP for Treatment

GSD completed upgrades to its Aeration System in 2002, which made the treatment plant a single stage activated sludge rather than a two-stage plant. This upgrade increased the design capacity of the treatment plant from 80 MGD to 120 MGD, helping to reduce the frequency and volume of CSOs. Also, GSD has recently been able to operate all the Raw Sewage Pumps in the Headworks Building to reach a peak flow over 150 MGD without compromising the quality of the plant's effluent.

GSD*'s Combined Sewer Overflow Minimization and Wet Weather Guideline* explain the importance to prepare the treatment plant for wet weather conditions and the strategies to be utilized during a wet weather event.

5.5.5 Elimination of CSOs During Dry Weather

Actions needed to prevent and eliminate dry weather overflows fall into two categories:

- Inspection
- Maintenance

By engaging in these activities, the ability to prevent dry weather overflows and take the necessary measures to prevent the occurrence of dry weather overflows before they start is enhanced. GSD inspects its CSOs daily and performs repairs as needed.

5.5.6 Control of Solid and Floatable Materials in the CSOs

The City of Gary provides street sweeping services. Each street is intended to be swept at least once per year; downtown area streets should be swept more often. Sweeping frequency requirements increase in the spring to remove grit from streets and in the fall to remove leaves from the streets. Street sweeping is a method to control solids and floatables from entering the combined sewer system. The City owns and operates hydraulic boom street sweepers. Trash receptacles located in the downtown and park areas are maintained by City or Park employees to help control debris that could enter the combined sewer system.

The design of the CSO regulators diversion structures was intended to capture solids and to minimize floatables as much as possible. Preventing the conveyance of floatables into the receiving streams during CSO events by retaining such material for return to the collection system and conveyance to the treatment plant is accomplished through the CSO regulator design. The regulators located along the Grand Calumet River have a double weir system that manages floatables. Each of the downstream weirs is higher in elevation that the upstream weir in the regulator structure and is the control feature on overflows to the Grand Calumet River. The regulators along the Little Calumet River have baffles installed to manage control floatables. Periodic inspection of the CSO regulators and cleaning as required is performed to minimize the discharge of solid and floatable materials during wet weather events.

5.5.7 Pollution Prevention Programs to Reduce Contaminants in CSOs

The City of Gary has ordinances prohibiting:

1. Littering from motor vehicles.
2. Disposal of garbage or rubbish on streets, rivers, parking lots, parks or other public property.
3. Dumping in or obstructing rivers, streams, drainage ditches, or places from which it may wash or fall therein.
4. Storing or depositing of any hazardous substances and other pollutants on the ground or in a manner that does not prevent run-off.

The following are specific actions conducted on an annual basis:

- The Lake County Solid Waste Management District operates a household hazardous waste program in conjunction with drop off days in the City of Gary. In addition, Gary residents can take household hazardous waste to any LCSWMD drop off sites. This program is the major avenue to keep the homeowner's hazardous waste streams out of the collection system and reduce the toxics that enters the system from the small, unmonitored sources.
- GSD has provided an informative video to help educate the public on how to assist in minimizing pollution.
- Pollution prevention information is transmitted to GSD customers with bills to inform citizens about wastewater treatment, conservation and other environmental issues of the day.

- GSD continues the use of an already effective IPP and has developed a comprehensive education program for industrial users geared toward the elimination of environmentally damaging pollutants.

The Gary Storm Water Management District (GSWMD) has developed and implemented a variety of measures designed to reduce both the quantity of stormwater run-off and the amount of sediment and other contaminants contained in the stormwater which enters the combined sewer system during rain events. These measures include:

1. Adoption and implementation of a comprehensive Storm Water Ordinance which regulates certain residential, commercial, and construction activities to minimize the volume of stormwater discharges from developed properties and improve the quality of stormwater run-off through the application of a variety of best management practices. The ordinance creates procedures for site plan review of construction plans and has procedures for site inspection and enforcement of control measures. The ordinance also includes post-construction stormwater run-off control requirements which contribute to the prevention and reduction of the discharge of pollutants like sediment which can reduce the capacity of the combined sewer system.

2. The Gary Storm Water Management District has implemented a Stormwater Quality Management Plan which includes 6 Minimum Control Measures with goals to reduce contaminants from entering the combined sewer system. These control measures are listed below:

    a. MCM 1 – Public Education and Outreach
    b. MCM 2 – Public Participation and Involvement
    c. MCM 3 – Illicit Discharge Detection and Elimination
    d. MCM 4 – Construction Site Storm Water Runoff
    e. MCM 5 – Post-Construction Storm Water Runoff
    f. MCM 6 – Municipal Operations Pollution Prevention and Good Housekeeping

3. Public information distribution and outreach events to educate residents, businesses, municipal departments, and contractors of best management practices to reduce stormwater run-off and improve water quality through the implementation of good housekeeping and other best management practices such as the use of rain barrels, rain gardens, green infrastructure, eliminating storm water connections to the sanitary sewer system, etc.

5.5.8 CSO Public Notification Plan

GSD has developed a CSO Public Notification Plan in fulfillment of its obligations under the United States Environmental Protection Agency's (USEPA's) Public Notification Requirements for Combined Sewer Overflows (CSOs) to the Great Lakes Basin, effective date February 7, 2018 (the Notification Rule; 40 CFR §122.38).

This CSO Public Notification Plan addresses the 4-hour and 7-day notification requirements of the Notification Rule. The monthly Discharge Monitoring Reports (DMRs) are already being submitted and will continue to be issued.

The Notification Rule requires that National Pollutant Discharge Elimination System (NPDES) permittees that have CSO discharges to the Great Lakes Basin must:

- Develop and submit to USEPA a CSO Public Notification Plan by August 7, 2018
    - Incorporate the CSO Public Notification Plan into the permittee's next permit renewal. GSD's NPDES permit expires June 30, 2022
- Implement CSO Public Notification Plan by November 7, 2018
- Submit Annual Report May 1, 2019 and each year thereafter

GSD submitted its plan in accordance with the guidelines on 8/7/2018. IDEM then responded with comments on 8/30/2018, and GSD submitted a revised plan on 9/29/2018, incorporating responses to those comments. The CSO Public Notification Plan has been implemented and the first Annual Report was submitted by May 1, 2019. The CSO Notification Plan is presented in **Appendix 8**.

5.5.8.1 Signage

Appendix 8 Section 2.0 presents a photograph of the signs now posted at each CSO outfall in GSD's system. Each sign shows the number of the CSO outfall as well as the NPDES permit number

5.5.9 Monitoring to Characterize CSO Impact and the Efficacy of CSO Controls

All permitted overflow points are monitored via telemetry continually. Monitoring activities include collection and review of the Telemetry System information as well as regular visits to each of the regulators to inspect each area for cleanliness and to identify any special needs or requirements. Any problems identified are followed up with work requires and prioritized so that corrective actions can be planned and implemented.

There is a plan to continue upgrading the lift stations with backup power and level sensing equipment minimize all overflows and to monitor peak flows during wet weather. In addition, lift stations are being equipped with Omni-site communications equipment to notify key personnel of alarm conditions at the lift stations.

GSD, working with USEPA and IDEM, is preparing a CSO LTCP, which will present a recommended Plan for further control on CSO discharges.

Section 6 – Schedule of Future Activities

6.1 Staffing

GSD staffing levels are adequate for completing the District's mission. The current staffing level is adequate for completing tasks required by the CSOOP.

6.2 Collection System

GSD completed a Large Diameter Sewer Cleaning and Televising Project that cleaned, televised and assessed all sewers 30-inch in diameter and larger. A total of 516,108 feet of sewers were covered and over 13,822 tons of materials were removed. Since the completion of this project, the number of customer complaints has dramatically decreased. Additionally, with the removed debris from the system, additional capacity in the sewer system has reduced the occurrence and volume of combined sewer overflows. The small diameter sewer flushing, and televising program is an on-going effort being conducted by GSD.

GSD has completed the construction of a flow modification project near 32nd Avenue and Broadway on March 2018. A new relief drop sewer and diversion structure were installed to reduce the frequency of combined sewer overflows to the Little Calumet River and maximize dry weather flow to the 60-inch Central Area relief interceptor.

GSD has completed the installation of a new force main for the 15th and Clay Lift Station. The new force main replaces an existing force main that was originally constructed in the mid-1960s. This force main is the only pipeline that conveys flow west from the 15th/Clay Lift Station to the wastewater treatment plant for the Calumet Region that includes Lake Station, New Chicago, and the Miller Beach, Aetna, and Glenn Ryan neighborhoods in Gary. The old force main was in poor condition and failure was eminent. The existing force main will be abandoned in place to provide GSD the potential to rehabilitate this pipe to provide system redundancy.

The GSWMD has recently disconnected several inlets and catch basins along the business corridor of Lake Street from the combined sewer system. This includes a four block stretch from 7th Avenue to 3rd Avenue. With this separation project, the storm water now enters four separate exfiltration chambers that has a designed capacity to treat a 100-year storm event.

The Gary Housing authority recently demolished public housing near 21st and Pierce Street. During demolition, a street inlet and catch basin was disconnected from the combined sewer system. These inlets are now connected to a perforated pipe system that allows storm water to percolate into the ground.

All seven Regulators along the Grand Calumet River have real-time SCADA Controls to monitor overflows and to control gates to initiate overflows. Additionally, a ***Combined Sewer Overflow Minimization and Wet Weather Guideline*** has been created. This guideline lays out the strategy to operate these gates to avoid or minimize combined sewer overflows.

6.3 Infiltration and Inflow Control Projects

Sewer lining projects have recently been completed in certain areas of the collection system. The following lists projects completed in the last few years:

- 38th Avenue – cave-in repair and sewer lining between Alley 1 East and Alley 5 East, March 2006
- 375 Johnson Street – CIPP repair, February 2015
- 403 Johnson Street – CIPP repair, February 2015
- 421 Grant Street – CIPP repair, February 2015
- 1500 Broadway Avenue - CIPP repair, February 2015
- 375 Johnson Street – CIPP repair, February 2015
- 4425 East 10th Avenue – CIPP repair, February 2015
- 5233 Carolina Street – CIPP repair, February 2015
- 5312 7th Avenue – CIPP repair, August 2019
- 5729 Melton Road – CIPP repair, August 2019
- 759 Grant Street - CIPP repair, September, 2019
- 5200 W. 54th Avenue - CIPP repair, January 2019
- 1744 Georgia Street - CIPP Repair, July 2019
- 1311 Orchard Street - CIPP Repair, July 2019
- 2401 Buchanan Street - CIPP Repair, May 2019
- 2100 Broadway - CIPP Repair, May 2019
- 411 Ellsworth Street - Manhole Lining Repair, July 2019
- 604 Vermont Street - Manhole Lining Repair, June 2019
- 1770 Hanley Street - Manhole Lining Repair, March 2019
- 758 Hanley Street - Manhole Lining Repair, May 2019
- 1206 Dakota Street - Manhole Lining Repair, May 2019
- 521 W. 34th Avenue - Manhole Lining Repair, May 2019
- 503 W. Ridge Road - Manhole Lining Repair, July 20196

During the Lake Street Sewer Separation Project discussed in Section 6.2, the GSD also lined several thousand feet of sewers in the alleys east and west of Lake Street from 3rd Avenue to 7th Avenue. Pipe diameters ranged from 12-inches to 54-inches. These alleys were also resurfaced with pervious asphalt which will alleviate storm water from entering the combined sewer system.

GSD has also completed a sewer lining and rehabilitation project in coordination with the Army Corps of Engineers in the Ambridge neighborhood in the City of Gary. While some of the sewers in decent conditions were lined, others were in such poor condition they had to be replaced entirely. This project area was bounded on the west by Bridge Street, on the south by 6th Avenue, on the east by Broadway, and to the north by 1st Avenue. Pipe diameters ranged from 12-inches to 30-inches.

During the calendar year 2020, GSD in coordination with the Army Corps of Engineers, plans to complete an additional sewer lining and rehabilitation project in the Horace Mann neighborhood of the City of Gary. The project area is bounded on the west by Taft Street, on the South by 8th

Avenue, on the east by Grant Street and 5th, and on the north by 5th Avenue. This project has already been awarded with construction planning to start in the spring of 2020. Pipe diameters range from 10-inches to 48-inches.

During the calendar year 2021, GSD in coordination with the Army Corps of Engineers, plans to complete a sewer rehabilitation project of a large trunk line on 13th Avenue from Johnson Street to Roosevelt Street. The sewer experienced a major cave-in near Garfield Street, and upon investigation, the remaining sewer segments are in very poor condition with eminent failure. The proposed project will replace approximately 2,030 linear feet of existing 30-inch, 42-inch and 48-inch poured in place concrete sanitary sewer with a new reinforced concrete (RCP) sewer of the same sizes, and in the same location and slope as the existing sewer. The sewer is approximately 10-15 feet deep.

6.4 Lift Station & Regulator Upgrades

GSD has eliminated the Permitted Overflow Point No. 003, which was located at the Old 27th and Chase Street Lift Station. GSD was able to eliminate this CSO during upgrades of the 27th and Chase Street Lift Station and increased the flow capacity of the Lift Station from 40 MGD to 80 MGD. This increase in capacity allowed this overflow point to be permanently closed.

GSD has constructed a New Relief Drop Sewer Structure at the existing 32nd and Alley 1 East diversion structure. The purpose of the new relief drop sewer is to: a) reduce the frequency and volume of combined sewer overflows to the Little Calumet River during wet weather by providing additional wet weather diversion capacity from Alley 1 East sewer to the 60-inch combined sewer that flows west to the 27th and Chase Street Lift Station, and b) maximize the use of the capacity of the 36-inch gravity combined sewer that flows north under the Borman Expressway (I-80/94) to GSD's WWTP via the Central Area/Alley 9 East interceptor during all flow conditions. This construction was completed in March 2018.

The 27th and Chase Street Lift Station had new Variable Frequency Drives (VFDs) installed on the pumps. This is the largest pump station of GSD's and services the southern portion of the City of Gary and three other Customer Communities including Lake Station, Merrillville and Hobart. Also, the No. 1 Bar Screen for this lift station was rebuilt and the No. 2 Bar Screen was replaced.

The pumps at the 25th and Calhoun Pump Station where reconfigured to a slightly higher elevations making the pumps run more efficiently and increasing their capacity. Additionally, a new emergency connection for a generator was installed in case back-up power is needed for this station. Also, the 25th and Bell and 27th and Calhoun Pump Station had an emergency connection for a generator installed in case back-up power is ever needed for these stations.

A new actuator was installed at the Chase Street Regulator. The old actuator was in need of replacement and had out served its useful life. This actuator allows GSD to control flow coming into the plant during heavy rain events to ensure the plant does not become inundated with wastewater and to ensure the treatment process does not become upset.

The Rhode Island and Alley 9 East Regulator Outfalls recently had Soil Erosion Control Mats installed to keep the grounds near the outfalls secure, and to ensure the structural integrity of the outfall structures.

6.5 Treatment Plant Upgrades

The Wastewater Treatment underwent upgrades in 2002 and now operates as a Single Stage Activated Sludge Plant, which increased the maximum day design flow to 120 MGD. Before the upgrades, GSD's WWTP was a two-stage plant with a maximum day design flow of 80 MGD.

GSD has completed the construction of the WWTP Tertiary Filter Building Rehabilitation. This project included the replacement of all the existing filter appurtenances including media, underdrains, and air piping. The new filters were designed with new deep bed coarse mono-media filtration system with air scour capabilities. The new filters also have the capabilities to add media and convert to deep bed denitrification filters if required in the future. The concrete underdrains and the backwash troughs were also replaced with this project. New Backwash Blowers was also installed along with new filters/silencers and new air conveyance piping from the blowers to filters for air scouring of the filters. Additionally, as part of this construction project a primary solids degritting system was constructed. This system removes grit that was not captured in the detritus tanks and removed it from the primary solids ahead of gravity thickening.

In 2019, the GSD Board of Commissioners awarded an agreement for an Aeration Improvement Project. This project includes replacement of GSD's blowers, replacement of the pipes that convey air from the blowers to the aerators and disinfection contact chambers, and replacement of valves and controls. This project is expected to be completed in December 2020.

GSD is accepting bids to replace the three boilers that fuel the digesters and the project is expected to be complete in 2020.

GSD is currently in the design phase of a Grit System Improvement Project that includes, replacing the current grit classifiers with grit washers, replacing grit pumps, and replacing all associated piping and controls. This project is expected to be completed in 2020 as well.

6.6 CSO Long Term Control Plan

GSD is in the process of developing its Long Term Control Plan, which will be the guide for future CSO mitigation activities. The schedule for the LTCP is included in GSD's Consent Decree (effective 3/19/2018).

As part of that process, GSD submitted to USEPA/IDEM:

- Revised CSO Characterization Report, 1/31/19

- Alternatives Analysis and Recommended Plan Evaluation, including CSO Technology Screening and Cost/Performance Analysis, 8/8/19

GSD also facilitated and participated in a number of calls and meetings to discuss various aspects of the LTCP:

- Agency Quarterly Meeting #4 re: Baseline Conditions, 5/31/19
- Public Participation Meeting #1, 7/11/19
- Agency Quarterly Meeting #5 re: Alternatives and Recommended Plan Evaluation, 9/30/19
- Agency Quarterly Meeting #6: Alternative Analysis and Recommended Plant Evaluation, 12/18/19

Upon receipt of USEPA approval of the USEPA Alternatives Analysis and Recommended Plan Evaluation, the next steps in this process are:

CSO Characterization Report, the next steps in this process are:

- Long Term Control Plan – Draft and Final
- Public Meeting #2
- Regulatory Agency Participation (throughout the process)

GSD will use the detailed information developed as part of the CSO Characterization Report, Stress Test Report, and Alternative Analysis and Recommended Plan Evaluation (including the CSO Technology Screening, Financial Capability Analysis, and Cost/Performance Analysis) to develop a system-wide CSO LTCP to abate the impacts of CSO discharges to meet the objectives and requirements of the 1994 CSO Control Policy.